Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

DEPARTMENT OF NOTES, REVIEWS, ETC.

It is the purpose, in this department, to present from time to time brief original notes, both of methods of work and of results, by members of the Society. All members are invited to submit such items. In addition to these there will be given a few brief abstracts of recent work of more general interest to students and teachers. There will be no attempt to make these abstracts exhaustive. They will illustrate progress without attempting to define it, and will thus give to the teacher current illustrations, and to the isolated student suggestions of suitable fields of investigation.—[Editor.]

TECHNICAL METHODS

1. *Electrifying the Microtome*

As this laboratory is specializing on a collection of serial sections of pig embryos, it became necessary in some manner to reduce the amount of time consumed as much as possible. After a careful study of the problem, it was decided to attach an electric motor to the microtome, thus leaving both hands of the technician free to handle the ribbons as they came off the knife. In this manner over one-third of the time ordinarily spent in section cutting was saved.

As the microtome used was an old type, of the steam engine crank motion with a large counter balanced fly wheel, it was rather hard to find the right kind of motor, especially as the fly wheel was not grooved for a belt, and could not be as its walls were too thin. Also there was no cheap and handy controller for ordinary motors to be had, except a belt tightener such as usually supplied on factory electrified microtomes.

Seeing the Western Electric sewing machine motor advertised, I asked the agent for a demonstration, and since then our motor trouble has been solved. The device consists of a small motor with a cork friction wheel, and mounted on a base so that when put underneath a sewing machine fly wheel a strong spring in the base will press the cork friction wheel against the fly wheel of the sewing machine. The motor was turned on its side with its base bolted to a block, and that block bolted to the table. The microtome wheel was then backed up onto the cork friction wheel of the motor until the requisite tension was secured, and then it also was bolted to the table. Thus both motor and microtome are both rigidly fastened down (Plate XXX).

Proceedings from the Zoological Laboratory of the North Dakota Agricultural College, No. 3.

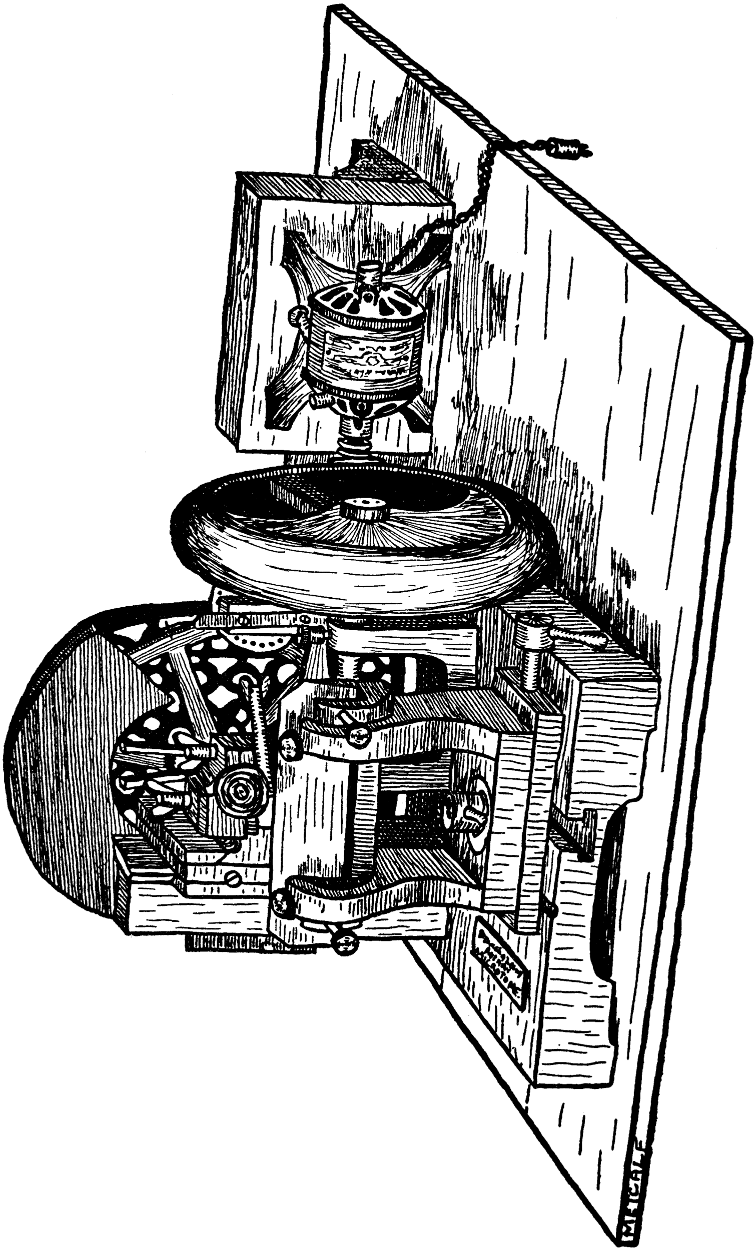

PLATE XXX

Variations in speed are obtained by means of the excellent foot controller which accompanies the motor. Although this controller allows only six variations in speed, I have always been able to regulate with complete satisfaction. While cutting serial sections my assistant never has to touch the fly wheel with his hands, as he is able merely by using the foot control to move the paraffin block a fraction of an inch at a time, as well as being able to cut the sections one by one if necessary. In this manner I have been able to cut celloidin sections with a slanting knife.

The outfit comes complete with motor, foot controller, and connecting cord, from the Western Electric Company or any of its agents, for $15. By its use I have already saved its price in the amount of time saved by my assistant, who is paid by the hour.

2. *Chart Making*

At best, chart making is laborious, and if the maker is not somewhat versed in the art of freehand drawing, the results are not all that could be wished. Especially is this true when the charts are copied from text book illustrations by students or student assistants.

To obviate this difficulty I have provided this laboratory with a "pantograph," an ingenious arrangement of levers costing $1.00, by which illustration and drawings may be copied exactly up to a magnification of eight diameters, which is usually all that is desired. If, however, a higher magnification is necessary, the drawing may be remagnified with the pantograph to any degree wanted. One merely provides a pencil on the end of one of the levers, sets it for the required magnification, and then traces over the drawing which is to be copied with a pointer, and the enlarged drawing is made by the pencil. In this way, and by using gummed black letters for labeling, charts, perfect in all respects, may be obtained by assistants who may never have had any artistic training.

It was found that charts hanging on the wall in the laboratory were attacked by the numerous "silver fish" *(Lepisma saccharina),* and the ink and colors eaten off. In the endeavor to stop this, every chart was sprayed with shellac, but as this did not entirely abate the nuisance, arsenic in small quantities was mixed with the inks and paints. At least the silver fish will have but one meal.

3. *Histological Technic*

All tissues while dehydrating are kept in a rubber stoppered bottle connected with a water jet vacuum pump. Thus while the tissues are dehydrating they are also being freed of air bubbles. Under a rather low vacuum it is surprising the amount of air which can be taken from most tissues.

In imbedding ordinary small blocks of tissue, benzine is used in place of xylol or benzole. In fact I have been using benzine for imbedding, dissolving paraffin off sections, cleaning slides, etc., where xylol was formerly used. In this way the cost of imbedding and section making is greatly reduced, as xylol is so very high in price at the present time. Xylol is used only in clearing sections before being mounted in xylol-balsam.

As a large number of horse tissues are sectioned and mounted each year for my class in veterinary histology, I have obtained very good results by using the paraffin method rather than the usual celloidin procedure. As these tissues are very tough, careful technic is necessary with paraffin, but the results, i e., clearer, thinner sections, and greater ease of handling, fully repay the added trouble.

These tough tissues, after dehydration and a stay in absolute alcohol, are then placed in a beaker in which there are two separate layers, one of cedar oil on the bottom, and one of absolute alcohol on top. The block is then placed in the beaker in the absolute, resting on the surface of the cedar oil. Gradually the block becomes infiltrated with cedar oil, sinking further and further into it. When the block comes to rest upon the bottom of the beaker it is then fully cleared and ready to be infiltrated with low melting point paraffin. Finally it is imbedded in hard paraffin, and sectioned with a slanting knife, keeping the sections from curling with a camels hair brush or a needle.

The paraffin used is the commercial PAROWAX, its melting point lowered if necessary by adding liquid petrolatum, or raised by adding olive oil. This is fully as efficient as the higher priced imbedding paraffins.

I have obtained an alcohol which approaches absolute alcohol for most practical imbedding purposes by distilling 95% alcohol, and storing the distillate in bottles, the bottoms of which are covered with a layer of anhydrous copper sulfate.

HERBERT EDMOND METCALF.

North Dakota
Agricultural College.

FURTHER NOTES ON THE REARING OF VOLVOX

In the April number of these Transactions for the year 1916, I related some experiences in the rearing of *Volvox aureus*. Since the two cultures whose histories were there given have ceased to yield and have been destroyed, the concluding chapter concerning those cultures may now be written. A summary of their histories from the time of writing the earlier account is as follows:

Culture No. 1, collected Oct. 27, 1915, on Apr. 27, 1916, contained many thousands of Volvox colonies. Then followed a period of decline until on June 7 not over six colonies were seen. During June there was a rapid increase. On June 17 a few colonies were seen. On June 19 over a hundred were counted and on July 10 they were very numerous. This was followed by a decline, for on Aug. 9 only about one hundred colonies were noted, but on Aug. 17 these had increased to more than a thousand, and on Sept. 7 the number was estimated at three to five thousand. At the time of the next observation, Oct. 13, very few colonies were present, but desmids had become very numerous. Thinking that the cool temperature outside might stimulate the Volvox to grow, the culture was put outside the window on Oct. 16. Eight days later there were several hundred colonies. Ice was found on the top of the water of the culture on the 16th of Nov., when the culture was brought inside. On the following day a few colonies were seen. Examinations were made on the following dates but no colonies could be found: Jan. 18, 1917, Feb. 16, Mar. 26, June 21. The culture was found with blue-greens on the last date and was destroyed.

In this culture to which no fresh water, no organic matter and no salts had been added since its establishment, Volvox grew for a little over a year and at times even thrived. Toward the close of the period the amount of available food materials must have been very slight.